



INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 14186/PCT		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/IB 03/00025	International filing date (day/month/year) 08.01.2003	Priority date (day/month/year) 09.01.2002	
International Patent Classification (IPC) or both national classification and IPC C08B37/08			
Applicant ABBOTT LABORATORIES DE COSTA RICA LTD et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input checked="" type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand  28.07.2003		Date of completion of this report  02.02.2004	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  Radke, M  Telephone No. +49 89 2399-8677 	

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/IB 03/00025**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-12 as originally filed

**Claims, Numbers**

1-39 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
  - ☐ the language of publication of the international application (under Rule 48.3(b)).
  - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
  - ☐ filed together with the international application in computer readable form.
  - ☐ furnished subsequently to this Authority in written form.
  - ☐ furnished subsequently to this Authority in computer readable form.
  - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
  - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4. The amendments have resulted in the cancellation of:
- ☐ the description, pages:
  - ☐ the claims, Nos.:
  - ☐ the drawings, sheets:
5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).
- (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*
6. Additional observations, if necessary:

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**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees, the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:

**see separate sheet**

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos. .

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	11-13,26-28
	No: Claims	1-10,14-25,29-39
Inventive step (IS)	Yes: Claims	
	No: Claims	11-13,26-28
Industrial applicability (IA)	Yes: Claims	1-39
	No: Claims	

2. Citations and explanations

**see separate sheet**

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**Re Item IV**

**Lack of unity of invention**

1. The separate inventions are:

(a) **Claims 1 to 30 (INVENTION 1):**

A process for the degradation of chitosan.

(b) **Claims 31 to 39 (INVENTION 2):**

Chitosan-Ca<sup>2+</sup>-complexes and methods for their preparation.

2. **INVENTION 1** and **INVENTION 2** are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

(a) The only feature which both **INVENTIONS** have in common is that the product of **INVENTION 1** may be used as the starting material in **INVENTION 2**.

(b) This product, i.e. the microcrystalline chitosan described in claim 31 as the starting material was, however, known (see **WO-A-91 09 163**, page 14, lines 20-24 and page 3, lines 27-35).

(c) The requisite unity of invention (Rule 13.1 PCT) therefore no longer exists inasmuch as a technical relationship involving one or more of the same or corresponding special technical features in the sense of Rule 13.2 PCT does not exist between the subject-matter of **INVENTION 1** and **INVENTION 2**.

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Cited literature**

(a) Reference is made to the following documents:

**D1:** PATENT ABSTRACTS OF JAPAN vol. 1995, no. 01, 28 February 1995 (1995- 02-28) & JP-A-06 293 801 & DATABASE WPI Week 199502 Derwent Publications Ltd., London, GB; AN 1995-009639

**D2:** PATENT ABSTRACTS OF JAPAN vol. 013, no. 472 (C-647), 25 October 1989 (1989-10-25) & **JP-A-01 185 301**

**D3:** PATENT ABSTRACTS OF JAPAN vol. 014, no. 250 (C-0723), 29 May 1990 (1990-05-29) & **JP-A-02 069 502** & DATABASE CHEMABS [Online] Chemical Abstracts Service, Columbus, Ohio, US; retrieved from STN Database accession no. 113:25846

**D4:** **WO-A-91 09 163**

(b) In the following arguments, page or column A, lines B to C will be cited as A/B-C.

**2. Preliminary remarks**

Ranges blurred by "such words as "about" prevent the invention from being unambiguously distinguished from the prior art ..." (PCT Examination Guidelines, III- 4.5a).

Therefore, such ranges in the claims were not taken into account when assessing novelty and inventive step (see also para. 5. below).

**3. Novelty**

(a) Document **D1** discloses the preparation of a low molecular weight chitosan by dissolving the chitosan in an acid at a concentration of from 1 to 30 wt%, adding hydrogen peroxide and stopping the reaction by adding a base until the pH is alkaline.

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In example 1, 20 g of chitosan is added to 180 ml water,  $H_2O_2$  and acetic acid are added, the reaction progresses for 18 h at 50 °C and is stopped by adjusted the pH to 10 by means of NaOH. The suspension is centrifuged, the supernatant dialysed and the concentrate is dropped into acetone to precipitate the product.

The subject-matter of **claims 1, 4-9, 10, 14 and 15** thus is not novel.

- (b) Document **D2** teaches a process for making low molecular weight chitosan by
- (a) preparing a solution containing 0.5 to 10 wt% of chitosan in an aqueous acid, such as acetic acid or hydrochloric acid (at an acid concentration of 0.5 to 10 wt%),
  - (b) adding alkali (such as NaOH) in order to obtain a suspension
  - (c) adding  $H_2O_2$  to decrease the molecular weight of the chitosan at a pH of from 7 to 12 and a temperature of from 40-90 °C.

Therefore, the subject-matter of **claims 16, 19-25, 29 and 30** is not novel.

- (c) Document **D3** teaches (see the Chemical Abstract) to treat chitosan at a pH of 5.8 with a chitosanase, then to add aqueous NaOH to reach a pH of 8 and to filtrate the suspension. The base can also be added after the reaction (see the Patent Abstarct of Japan)..

So, the subject-matter of **claims 1-3, 6, 10, 16-18 and 25** is not novel in view of **D3**.

- (d) Document **D4** discloses in example 2 to blend
- (a) 390 parts by weight of a microcrystalline chitosan having an average molecular weight of 28.1 kDa, a water retention value WRV of 535 % and a degree of deacetylation of 67.5 %, with
  - (b) 11.0 parts by weight of  $CaCl_2$  and
  - (c) 100 parts by weight of water
- in the presence of a surfactant.

The subject-matter of **claims 31-39** thus is not novel.

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**4. Inventive step**

The additional features of claims 11 and 26 (i.e. the use of  $\text{Na}_2\text{CO}_3$ ,  $\text{K}_2\text{CO}_3$  or  $(\text{NH}_4)_2\text{CO}_3$  as the neutralising agent) and of claims 12, 13, 27 and 28 (enzyme deactivation at elevated temperatures) just provide alternative process features well known and obvious to the expert.

Therefore, the subject-matter of these claims is not based on an inventive step.

**5. Clarity of the claims**

The word "about" blurs the ranges given in claims 1, 13, 15, 16, 28 and 30 thus rendering these claims unclear.